

## ABSTRACT

The present invention provides for a monolith reactor process for the production of syngas from hydrocarbon and oxygen feeds. The syngas is cooled and separated to produce carbon monoxide and hydrogen, and the purification equipment utilized in this separation process recycles tail gas and fuel gas to the syngas feed gas line and  
5 recycles methane from the carbon monoxide separation system for feed back to the monolith reactor. This process results in almost complete carbon to carbon monoxide conversion and very high carbon monoxide and hydrogen recoveries.